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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/528,889	03/20/2000	Gregory N. Hullender	1204	5627

7590 12/02/2004

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EXAMINER

DASTOURI, MEHRDAD

ART UNIT PAPER NUMBER

2623

DATE MAILED: 12/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/528,889

Applicant(s)

HULLENDER ET AL.

Examiner

Mehrdad Dastouri

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-5 and 7-27 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 29, 2004 has been entered.
2. 35 U.S.C. 112, first paragraph rejection of Claims 1-27, has been withdrawn in view of Applicants' amendment.
3. Applicants' remarks filed June 9, 2004, have been fully considered but they are moot in view of new grounds of rejection.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 4, 5, 7, 8, 10-15, 17, 19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Paek et al., (hereinafter Paek), (On-Line Korean Character Recognition by Using Two Types of Neural Networks; IEEE Paper: Neural Networks, IJCNN '93-Nagoya).

Regarding Claim 1, Paek discloses a method of recognizing chirographs (handwritten characters) input into a computer system, comprising:

providing a primary recognizer for converting chirographs to shape indexes (Figure 2.1, 2.2 and 3.1; Pages 2113-2114, Sections 2 and 3.1), the primary recognizer providing output including a shape index when a chirograph is input thereto (Figures 3.1 and 3.2; Page 2114, Section 3.1, Computation of Direction Codes; Neural Network No. 1, Stroke Recognition NNW);

providing a plurality of secondary recognizers to convert chirographs into code points (Neural Network No. 2, Character Composition NNW, comprises a plurality of outputs that consist of 11 recognizers for 11 stroke classes as depicted in Figure 3.3), and associating the secondary recognizers with at least some of the shape indexes (Figure 3.3, Set of Stroke Classes; Pages 2114 and 2115, Section 3.2);

receiving a chirograph (Figure 2.1, Section 2, Korean Characters);

providing the chirograph to a primary recognizer and receiving a shape index therefrom (Figures 3.1 and 3.2; Page 2114, Section 3.1, Computation of Direction Codes; Neural Network No. 1, Stroke Recognition NNW);

determining by a separate look-up process (Figure 3.3, Set of Stroke Classes) whether one of the secondary recognizers is associated with the shape index (Page 2114, Section 3.2; Figure 3.2 and 3.3. The composition network (second network) is associated with the selected 11 classes.), and if so, selecting that secondary recognizer as a selected secondary recognizer and passing the chirograph to the selected recognizer, the secondary recognizer returning a code point (Figures 3.2 and 3.3;

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Sections 3.1 and 3.2, Pages 2114-2115. As depicted in Figure 3.2, the output of Character Composition NNW comprises character codes.).

As per Claim 2, Paek further teaches:

wherein the shape index comprises a code point (Figures 3.1 and 3.2, Directional Codes of Stroke Code Vector).

As per Claim 4, Paek teaches: training the secondary recognizers by providing a first training set comprising a plurality of chirographs and actual code points for each chirograph (Abstract, Lines 7-10; Page 2115, Section 3.2, last two paragraphs).

As per Claim 5, Paek teaches: wherein training the secondary recognizers further comprises determining a plurality of distinguishing features of the chirographs based on predetermined criteria (Abstract, Lines 7-10; Page 2115, Section 3.2, last two paragraphs; Section 4.1, Training of 50 sets of collected data.).

Regarding Claim 7, Paek discloses a method of recognizing a chirograph input into a Computer System, Comprising:

receiving a chirograph (Figure 2.1, Section 2, Korean Characters);

providing the chirograph to a primary recognizer to make a first decision as to a shape index that corresponds to the chirograph (Figures 3.1 and 3.2; Page 2114, Section 3.1, Computation of Direction Codes; Neural Network No. 1, Stroke Recognition NNW); and

without further decision by the primal recognizer:

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selecting a second recognizer from a lookup table based on the shape index (Neural Network No. 2, Character Composition NNW has been selected based on 11 stroke classes depicted in Figure 3.3.);

providing the chirograph to the secondary recognizer (Figures 3.2 and 3.3); and

returning the recognition result from the secondary recognizer (Figures 3.2 and 3.3; Sections 3.1 and 3.2, Pages 2114-2115. As depicted in Figure 3.2, the output of Character Composition NNW comprises recognition results.).

With regards to Claims 8, 10 and 11, arguments analogous to those presented for Claims 2, 4 and 5 are applicable to Claims 8, 10 and 11.

As per Claim 12, Paek teaches: wherein the recognition result comprises a code point (Figures 3.2 and 3.3; Sections 3.1 and 3.2, Pages 2114-2115. As depicted in Figure 3.2, the output of Character Composition NNW comprises character codes or code points.).

With regards to Claims 13 and 20, arguments analogous to those presented for Claim 1 are applicable to Claims 13 and 20. With regards to Claim 13, Paek further discloses an interface configured to receive a chirograph and provide it to the primal recognizer (Page 2114, Section 3.1; Figure 3.1).

As per Claim 14, Paek further discloses the system of Claim 13 wherein the shape index comprises a single code point (Section 3.1; Figure 3.1, Each shape index comprises a single stroke code vector.).

As per Claim 15, Paek further discloses the system of Claim 13 wherein the shape index comprises a single code point that differs from the returned code point

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(Sections 3.1 and 3.2; Figures 3.1 and 3.2. The shape index code point (stroke code vector) is different from the output code points or characters found by using the stroke class codes depicted in Figure 3.3).

As per Claim 17, Paek further discloses the system of Claim 13 wherein the recognition result comprises a single code point (Figures 3.2 and 3.3; Section 3.2. The recognition results comprise of single code point or a character code.).

As per Claim 19, Paek further discloses the method of Claim 1 wherein each shape index that the primary recognizer is capable of outputting has a unique secondary recognizer associated therewith (Figures 3.2 and 3.3; Section 3.2).

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claims 7 and 21-24 are rejected under 35 U.S.C. 102(a) as being anticipated by Su et al. (hereinafter Su) (Segmentation and Recognition of Unconstrained Numerals on Chinese Bank-Check, IEEE Paper ISBN: 0-7803-3280-6).

Regarding Claim 7, Su discloses a method of recognizing a chirograph input into a Computer System, Comprising:

receiving a chirograph (Figure 1, handwritten characters "1475000");

providing the chirograph to a primary recognizer to make a first decision as to a shape index that corresponds to the chirograph (Figures 2, 3, 5 and 6; Pages 2227-2229, Section 2. The string of handwritten digits (chirographs) is the input to the primary

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recognizer (Segmentation Section) and the individual digits or the strokes after overlapping and broken digits problems have been solved are the shape indexes.); and without further decision by the primal recognizer:

selecting a second recognizer from a lookup table based on the shape index (Sections 3.1 and 3.2; Figure 7, Subnetwork 1 is the second recognizer to recognize "0", and subnetwork 2 is the second recognizer to recognize other digits; Figures 8 and 9); providing the chirograph to the secondary recognizer (Figures 7 and 8); and returning the recognition result from the secondary recognizer (Figures 7-9; Sections 3 and 4, Pages 2229-2230).

Regarding Claim 21, Su discloses the method of Claim 7 wherein the shape index does not correspond to a code point (Figure 8, The rejected stroke (shape index) that does not correspond to digits 0-9)..

Regarding Claim 22, Su discloses the method of Claim 7 wherein each shape index that the primary recognizer is capable of outputting has a unique secondary recognizer associated therewith (Figure 7, Subnetwork 1 is the second recognizer to recognize "0", and subnetwork 2 is the second recognizer to recognize other digits.).

With regards to Claim 23, arguments analogous to those presented for Claim 7 are applicable to Claim 23.

With regards to Claim 24, arguments analogous to those presented for Claim 21 are applicable to Claim 24.

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9. Claim 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshii (U.S. 6,233,352).

Regarding Claim 18, Yoshii discloses a computer-readable medium having computer-executable instructions, comprising:

receiving a chirograph (Figure 1, Numeral 101, unprocessed learning pattern; Column 3, Lines 10-11);

providing the chirograph to a primary recognizer and receiving recognition information therefrom (Figure 1, Numerals 102 and 103; Column 3, Lines 11-14); and without further decision by the primal recognizer:

determining whether the recognition information corresponds to a recognized result or has a value indicative of a CART tree being associated therewith (Figure 7; Column 4, Lines 13-33); and

if the recognition information corresponds to a recognized result, returning the recognized result (Figure 7; Column 4, Lines 22-23, certain category (for example '1'), and if the recognition information has the value indicative of the CART tree being associated therewith, providing chirograph information to the CART tree and returning a recognition result therefrom (Figure 7; Column 4, Lines 24-249).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 3, 9 and 16 are rejected under 35 U.S. C. 103(a) as being unpatentable over Paek as applied to Claim 1 above further in view of Wang et al. (hereinafter, Wang), (U.S. 5,926,566).

Regarding Claim 3, Paek does not explicitly disclose the method of Claim 1 wherein at least one of the secondary recognizers comprises a CART tree.

Wang, in the same field of endeavor of handwritten recognition using multiple recognizers, disclose a method for incremental recognition of ideographic hand writing using pre-classifier and detailed classifier, wherein the second recognizer (detailed classifier) comprises a CART tree (Column 4, Lines 1-15; Column 18, Lines 17-33; Column 19, Lines 37-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Paek's invention according to the teachings of Wang to utilize the secondary recognizers as a CART tree because it will expand the versatility of handwriting recognition system. Utilizing statistical classifiers create much more accurate results (Wang, Column 3, Lines 65-67, Column 4, Line 1), and pre-classifier errors are compensated by allowing more than one detailed classifier to recognize a character (Wang, Column 19, Lines 28-30).

With regards to Claims 9 and 16, arguments analogous to those presented for Claim 3 are applicable to Claims 9 and 16.

12. Claim 25 is rejected under 35 U.S. C. 103(a) as being unpatentable over Paek as applied to Claims 13 above in view of Su (Segmentation and Recognition of Unconstrained Numerals on Chinese Bank-Check, IEEE Paper ISBN: 0-7803-3280-6).

With regards to Claim 25, arguments analogous to those presented for Claims 14 and 21 are applicable to Claim 25.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Su's invention according to the teachings of Paek to incorporate further limitations recited in Claim 25 because these limitations are standard decision making features and methodology routinely implemented in handwriting recognition systems.

13. Claim 26 is rejected under 35 U.S. C. 103 (a) as being unpatentable over Yoshii (U.S. 6,233,352) as applied to Claim 18 above further in view of Su et al. (hereinafter Su) (Segmentation and Recognition of Unconstrained Numerals on Chinese Bank-Check, IEEE Paper ISBN: 0-7803-3280-6).

With regards to Claim 26, arguments analogous to those presented for Claim 21 are applicable to Claim 26.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yoshii's invention according to the teachings of Su to incorporate further limitations recited in Claim 26 because these limitations are standard

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decision making features and methodology routinely implemented in handwriting recognition systems.

14. Claim 27 is rejected under 35 U.S. C. 103 (a) as being unpatentable over Yoshii (U.S. 6,233,352) as applied to Claim 18 above further in view of Paek et al., (hereinafter Paek), (On-Line Korean Character Recognition by Using Two Types of Neural Networks; IEEE Paper: Neural Networks, IJCNN '93-Nagoya).

With regards to Claim 27, arguments analogous to those presented for Claim 14 are applicable to Claim 27.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yoshii's invention according to the teachings of Paek to incorporate further limitations recited in Claim 27 because these limitations are standard decision making features and methodology routinely implemented in handwriting recognition systems.

Other prior art cited

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

IEEE Paper to Wang et al., "A Multi-Layer Classifier for Recognition of Unconstrained Handwritten Numerals", IEEE Paper ISBN: 0-8186-7128-9.

Allowable Subject Matter

16. Claims 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 6 of the instant invention recites the method of Claim 5 wherein the predetermined criteria correspond to questions, and wherein training the secondary recognizers further comprises determining a question ordering by measuring the quality of each question.

Contact Information

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mehrdad Dastouri whose telephone number is (703) 305-2438. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mehrdad Dastouri
Primary Examiner
Art Unit 2623
November 24, 2004

MEHRDAD DASTOURI
PRIMARY EXAMINER

Mehrdad Dastouri